United States Patent [19]

Chezem

[11] **4,163,574**

[45] **Aug. 7, 1979**

[54] **DOOR STOP FOR INWARD OPENING DOOR**

[76] Inventor: **Jimmie A. Chezem**, Rte. 9, Box 164A, Sparta, Tenn. 38583

[21] Appl. No.: **887,671**

[22] Filed: **Mar. 17, 1978**

[51] **Int. Cl.**[2] **E05C 3/12**

[52] **U.S. Cl.** **292/338**; 292/DIG. 15

[58] **Field of Search** ..... 16/86 A, 86 C, 82, 86 R; 292/338, DIG. 15

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,731,341	5/1973	Woodruff	292/338 X
3,737,186	6/1973	Chezem	292/338
3,809,419	5/1974	Chezem	16/86 A

Primary Examiner—George H. Krizmanich

Attorney, Agent, or Firm—Clarence A. O'Brien; Harvey B. Jacobson

[57] **ABSTRACT**

An occupant safeguarding door stop for use on the interior surface of the lower edge portion of a sliding door or window or vertically hinged inwardly openable door has a base securely mountable on the interior surface of the door in a portion thereof adjacent to but above the level of a sliding door or window, or a lower edge portion of the vertically hinged door. A rigid leg member aligned with the base is pivotally joined to the base, and has a foot portion arrangeable for being forcibly pressed and readily actuated toward a gripping portion engaging the overhead frame of a sliding door or window, or a floor associated with the door by foot or hand applied pressure. A torsion spring, and the like, is connected to the base and leg member for biasing the leg member toward a raised position away from the floor, or a lowered position away from the frame of sliding doors/windows, while a locking device mounted on the base selectively engages the leg member and holds same in any one of several gripping positions depending on the distance between the base and/or the floor or the overhead frame. In this manner, precise positioning of the stop on the door becomes unnecessary, and more importantly re-surfacing of the floor or overhead frame of sliding door/windows which may change the distance thereof from a previously installed stop does not require re-positioning of the stop.

3 Claims, 6 Drawing Figures

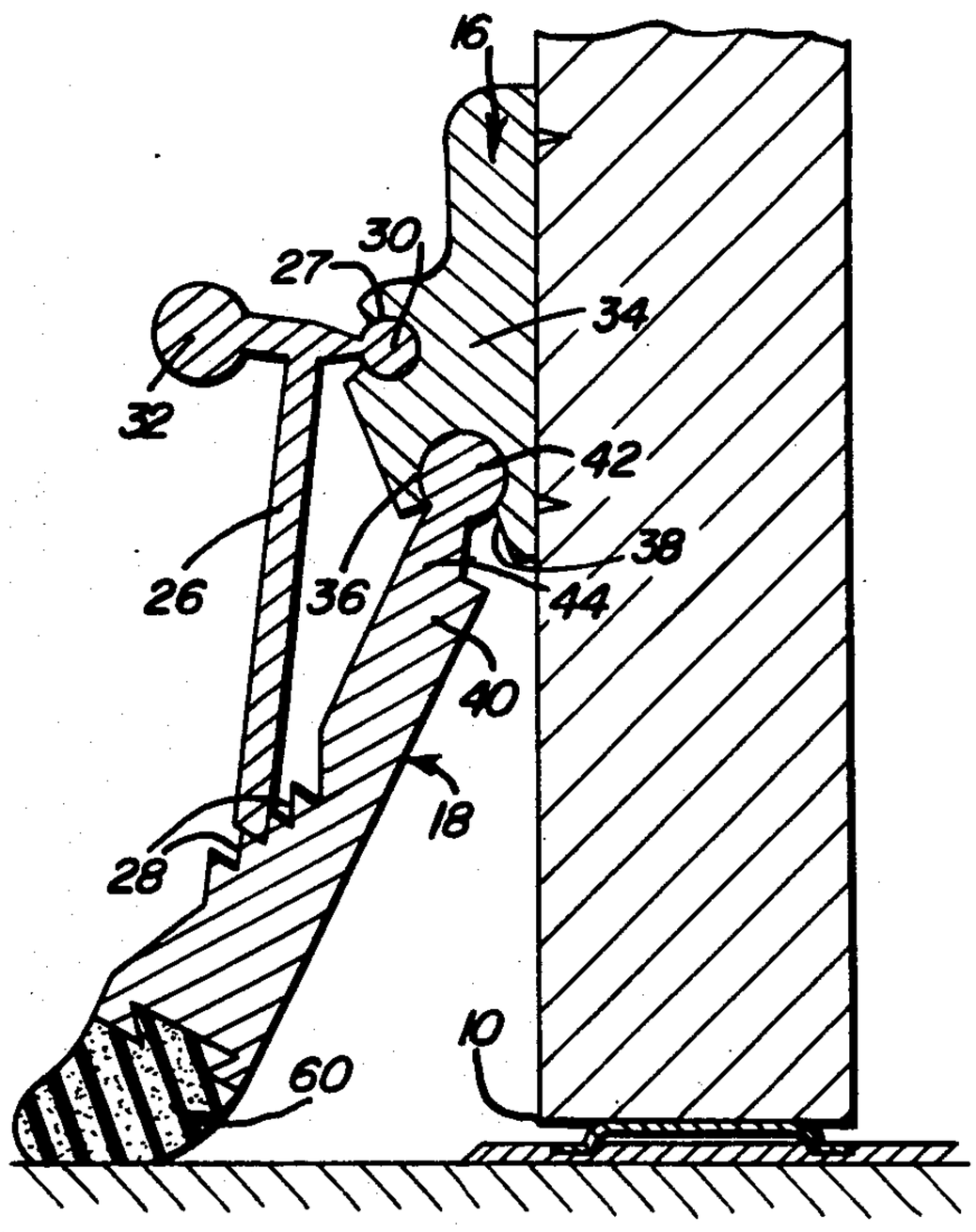


Fig. 1

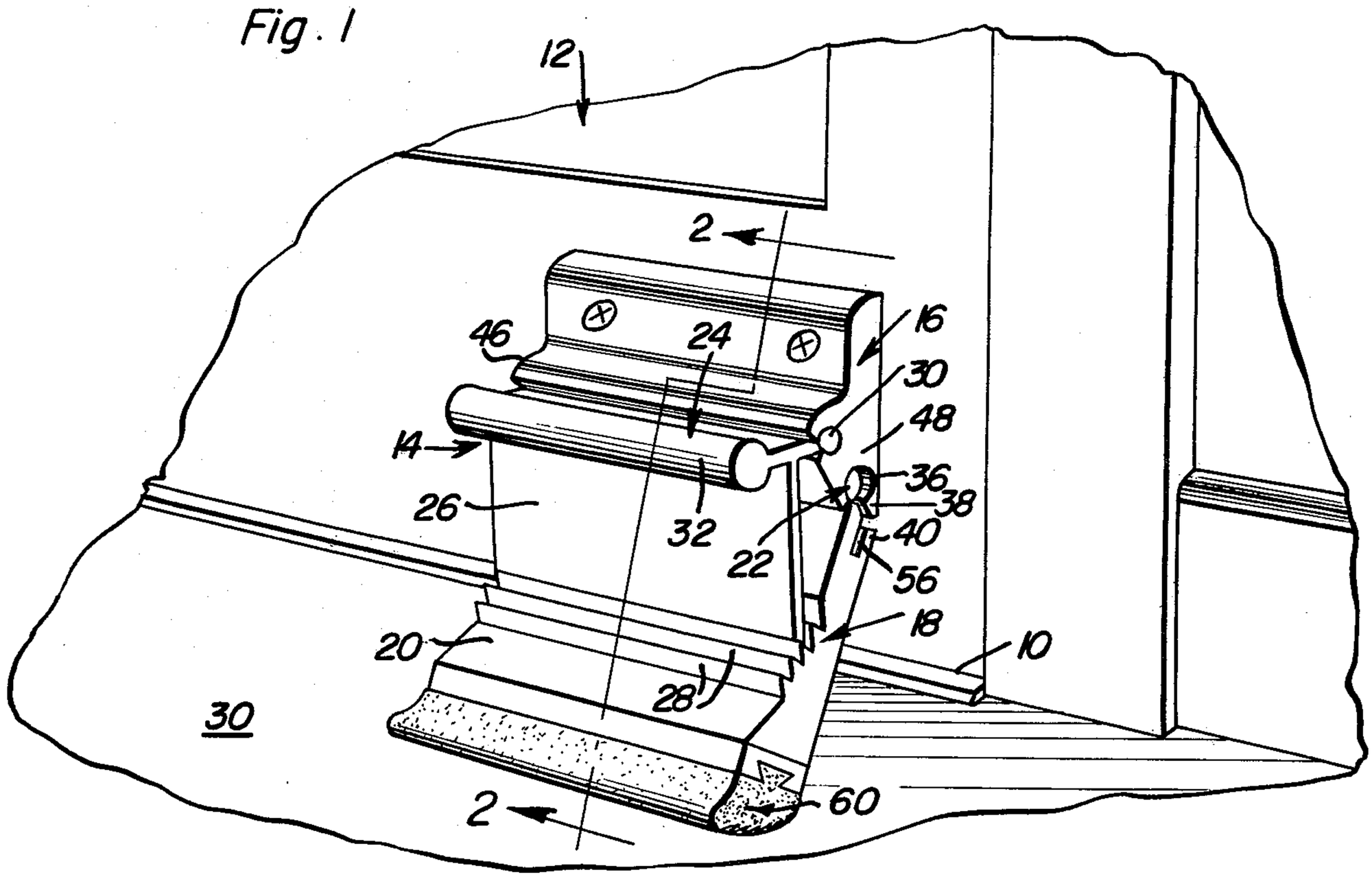


Fig. 2

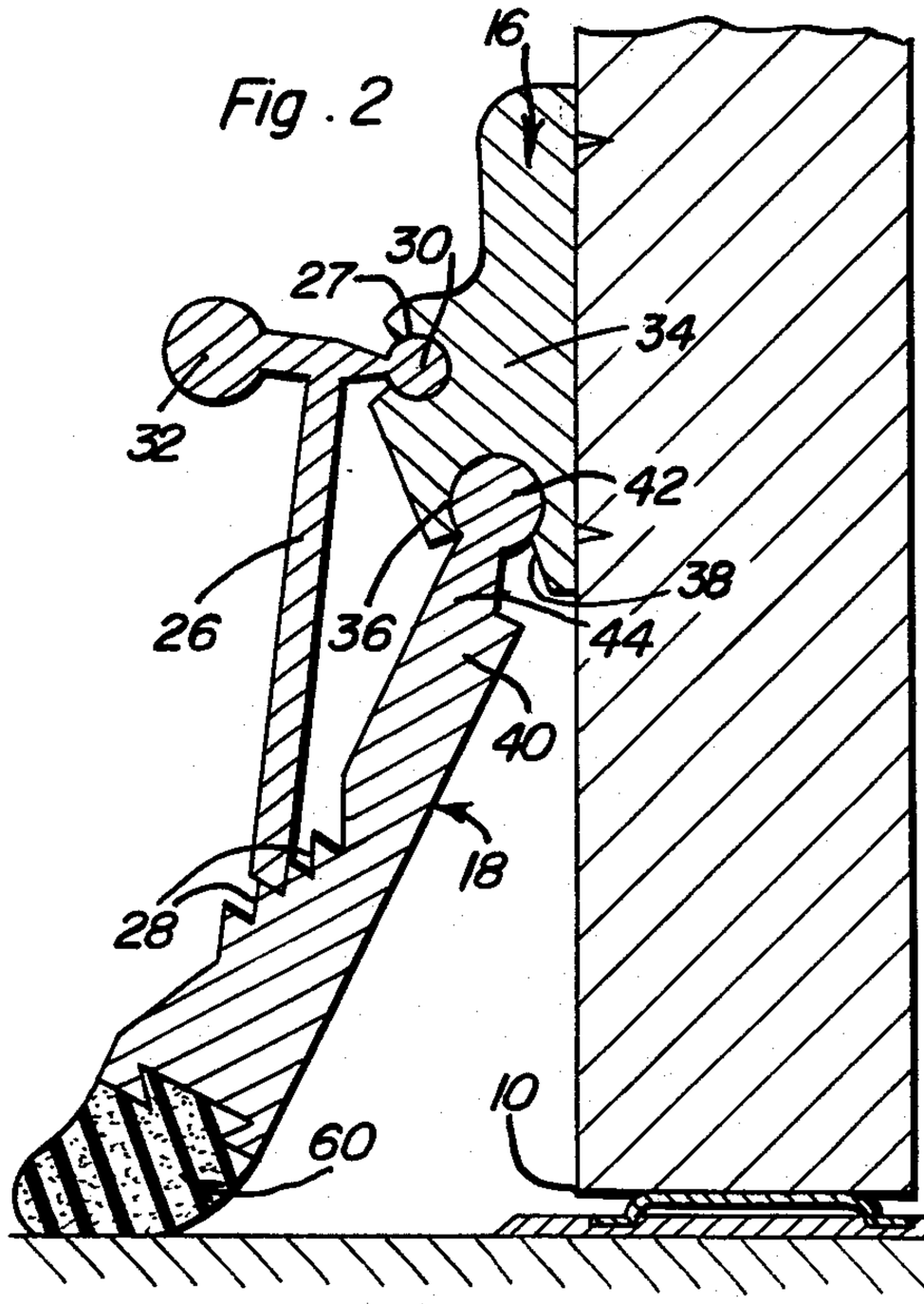


Fig. 3

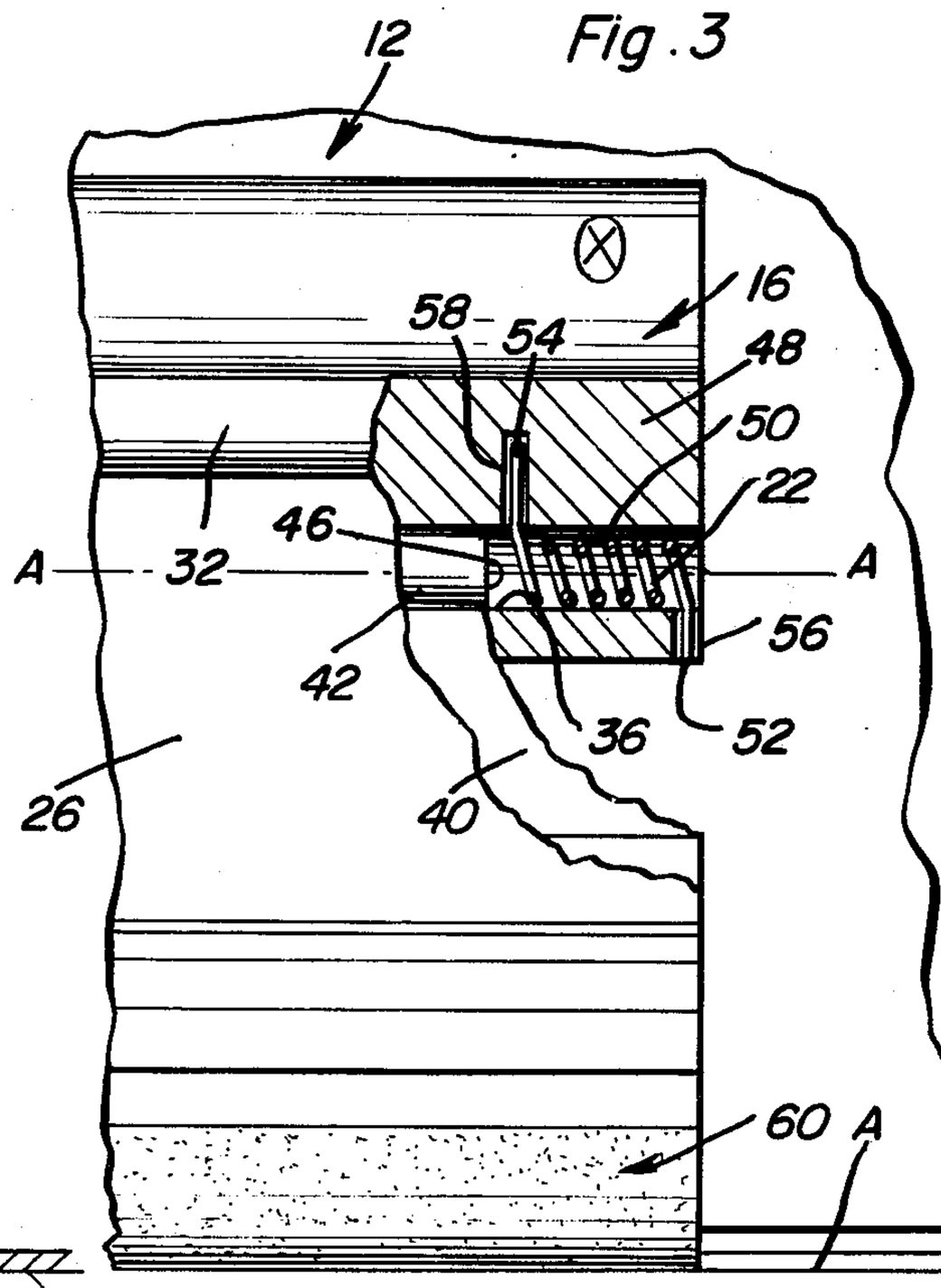


Fig. 4

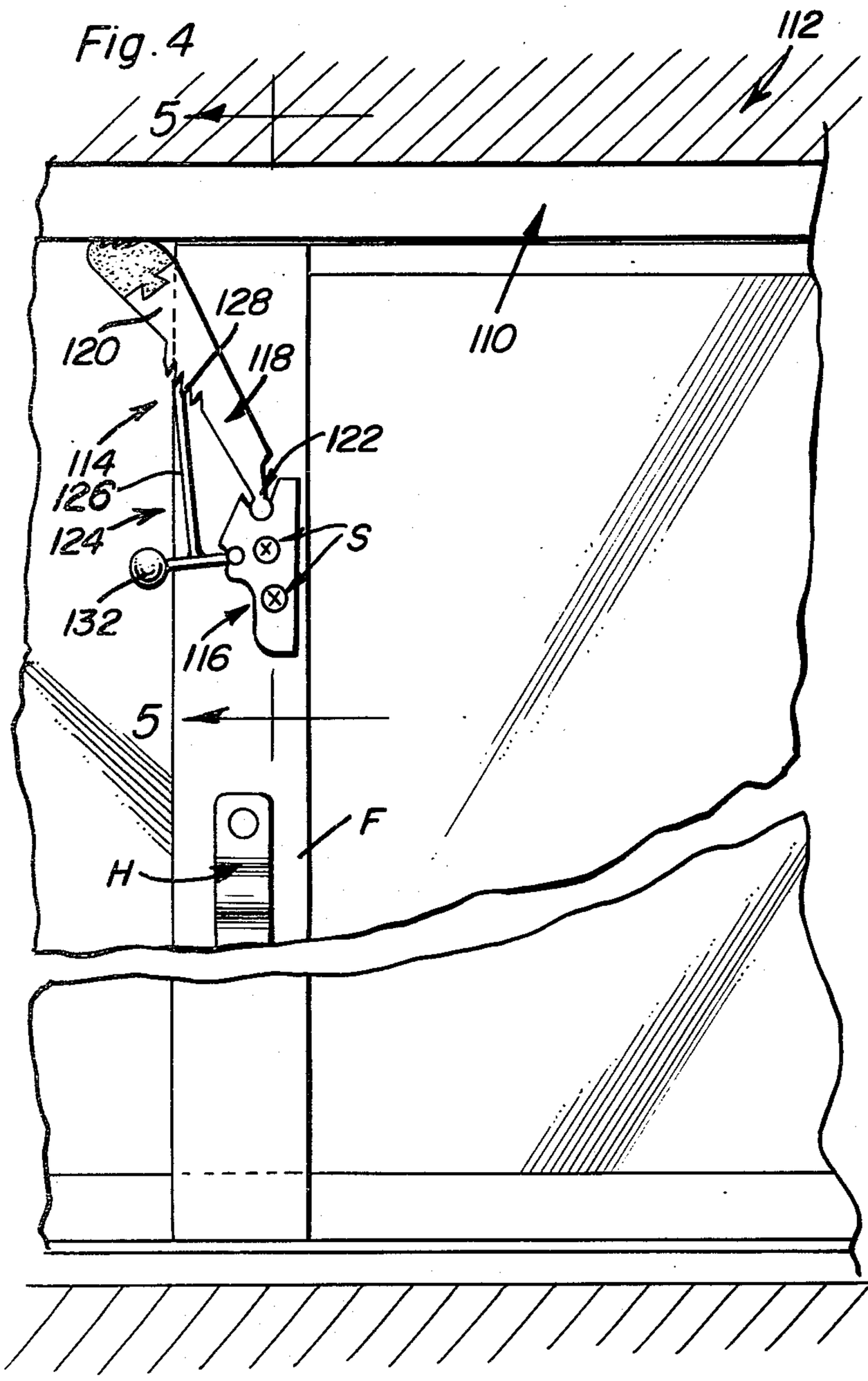


Fig. 5

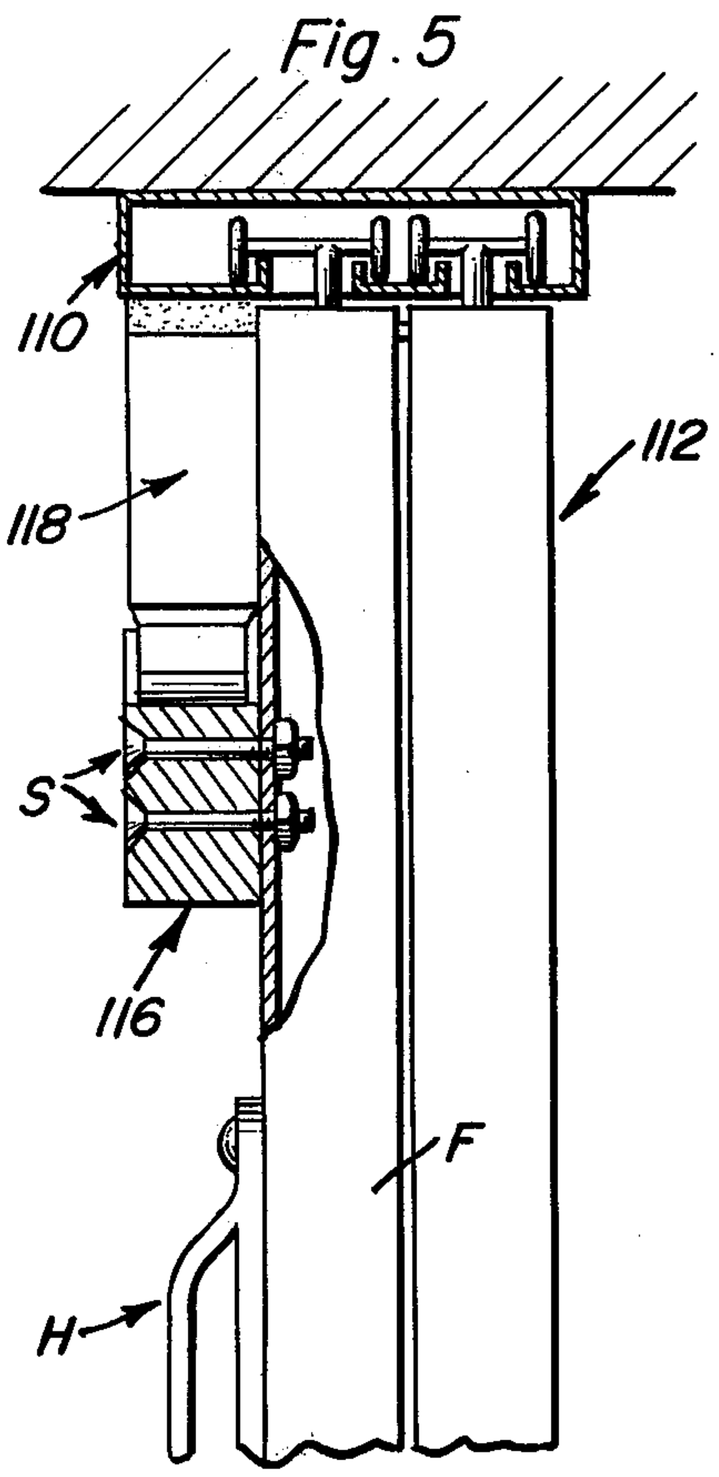
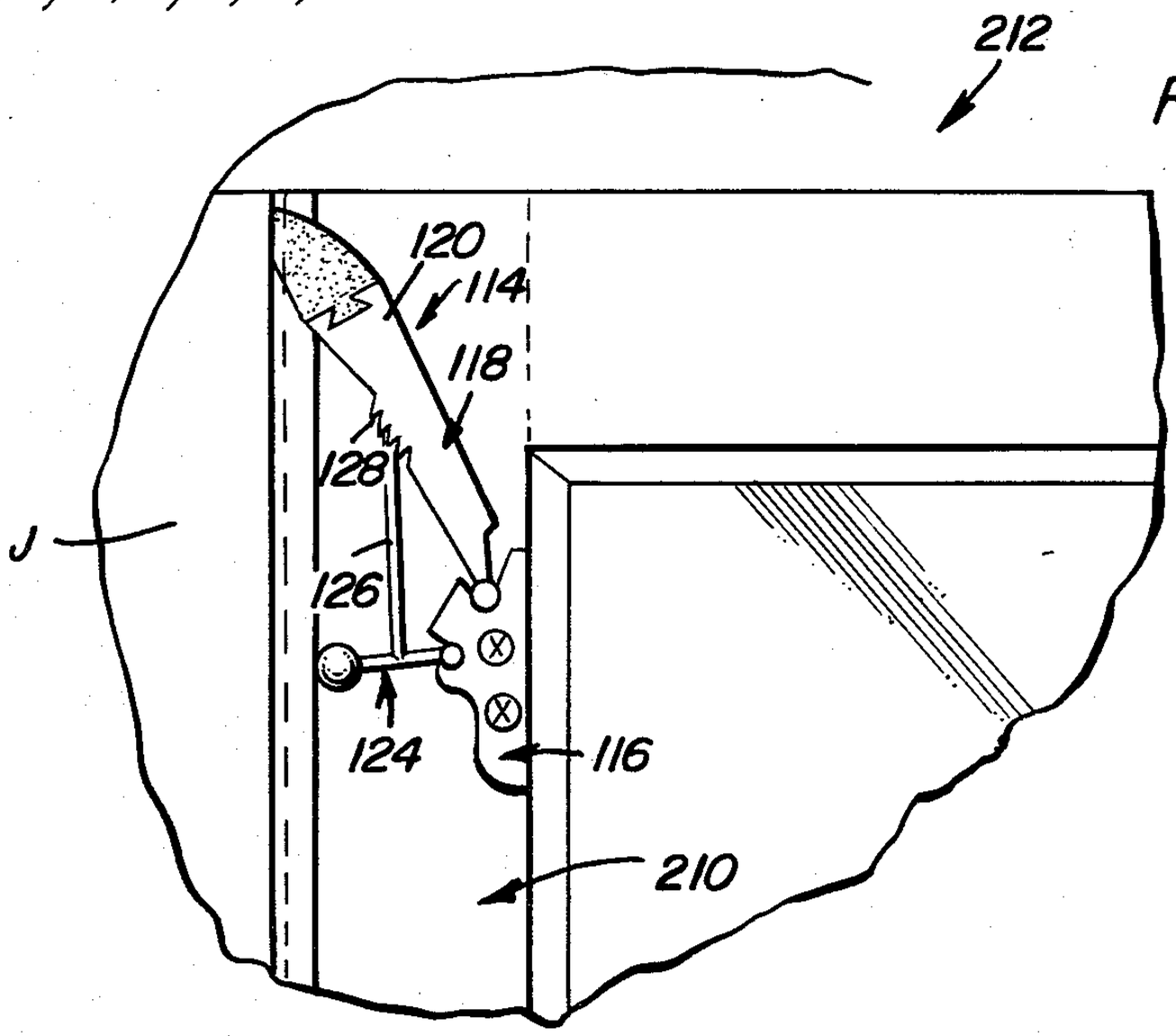


Fig. 6



DOOR STOP FOR INWARD OPENING DOOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to an occupant safeguarding door stop or check, and particularly to a stop suitable for use on a vertically hinged inwardly openable door or sliding horizontal doors and/or windows.

2. Description of the Prior Art

My prior U.S. Pat. Nos. 3,737,186 and 3,809,419, issued on June 5, 1973, and May 7, 1974, respectively, disclose occupant safeguarding door stops which permit an occupant of a dwelling to effectively cope with stopping the entrance of unauthorized persons even though the door is in a partially open position. Generally speaking, my prior stops include a base mountable on the lower portion of the inner surface of a vertically hinged door, and have pivotally mounted thereto a rigid leg member which can be pushed as by foot pressure into a position frictionally engaging a floor associated with the door and locked into the floor-engaging, door-retarding position regardless of efforts to manipulate the door in a manner contemplated to release the stop. The same principle applies to horizontally sliding doors/-windows, with bottom member holding overhead to door frame or window frames.

A difficulty encountered with my prior door stops, however, is that the locking mechanisms are somewhat critical of precise mounting of the stop on an associated door or window, and that situations are encountered wherein subsequent to mounting a stop on a door, the surface of the associated floor or overhead door track is varied as by laying vinyl tile over a wood floor, or placing carpeting on the floor, and the like, which causes the distance between the stop and the floor or sliding door frame to vary. Accordingly, the locking mechanism of the stop will not be engaged when the stop is pressed into floor-engaging or overhead frame of sliding door/window, door-stopping position.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an occupant safeguarding door stop specifically intended for use on both the interior surface of a vertically hinged inwardly openable door and on overhead frames of sliding doors/windows.

It is another object of the present invention to provide an occupant safeguarding door stop which can be used with a multiplicity of doors on various kinds of floors as well as frames of sliding doors/windows.

These and other objects are achieved according to the present invention by providing an occupant safeguarding door stop having: a base securely mountable on an interior surface of an associated inwardly opening door in a position adjacent to but above the level of a lower edge portion of the door or below the upper edge of sliding doors and windows; a rigid leg member aligned with and pivotally joined to the base and having a foot portion arranged for being forcibly pressed and readily actuated toward a gripping position engaging a floor or top of sliding door frame associated with the door by foot or hand applied pressure; a torsion spring connected to the base and the leg member for biasing the leg member toward a raised position away from the floor or overhead door frame; and a locking device mounted on the base for selectively engaging the leg member and holding same in any one of several gripping positions depending on the overhead or floor-engaging, door-stopping angle between the base and the leg member, which angle is a function of the distance between the base of the stop and the overhead sliding door frame or the floor being engaged in order to stop the associated door or window.

The locking device advantageously includes an element pivotally mounted on the base and disposed extending toward the leg member. A plurality of substantially parallel grooves are provided on the leg member in an outwardly disposed surface thereof for selectively receiving the element and retaining the leg member in its overhead frame or floor-gripping, door-stopping position. The exact groove receiving the element is a function of the angle between the base and the leg member in the door or window stopping position, which angle is itself the distance between the base and the floor or upper edge and overhead frame, and the desired deflection of the element.

The leg member preferably extends longitudinally in a direction lateral of the pivot axis thereof, with the base including a lower portion provided with a longitudinal through hole normal to the extent of the leg member and open along one longitudinal side. The leg member has an upper portion spaced from the foot portion thereof and provided with a transversely elongated head pivotally disposed in the through hole, with a neck connecting the head to the remainder of the leg member being disposed in the open side of the through hole provided in the base.

The longitudinal extent of the head is advantageously less than the longitudinal extent of the through hole provided in the base, with the head and hole terminating in alignment at a one of a pair of longitudinal end surfaces partially forming the base. This arrangement leaves a space in the through hole of the base at the other of the end surfaces in which the torsion spring can be disposed. Slots are suitably provided in the base and leg member for receiving ends of the spring in such a manner that the torsion spring biases the leg member in a direction away from its door or window stopping position such that it will pivot around the pivot axis thereof toward a plane substantially parallel to and adjacent the base or overhead frame.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a fragmentary, perspective view showing a door stop according to the present invention mounted on the lower edge portion of the inner surface of a vertically hinged door.

FIG. **2** is an enlarged, fragmentary, sectional view taken generally along the line **2**—**2** of FIG. **1**.

FIG. **3** is an enlarged, front elevational view, partly cut away and in section showing the right-hand half of the door stop illustrated in FIG. **1**.

FIG. **4** is a fragmentary, front elevational view, partly in section, showing a door stop according to the present invention and mounted adjacent the upper frame of a horizontally sliding door or window.

FIG. **5** is a fragmentary sectional view taken generally along the line **5**—**5** of FIG. **4**.

FIG. **6** is a fragmentary, front elevational view showing a door stop according to the present invention mounted on a horizontally sliding window.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to FIGS. **1–3** of the drawings, there is shown mounted on the lower edge portion **10** of the inner surface of a vertically hinged inwardly openable door **12**, of conventional construction, an occupant safeguarding door stop **14** according to the invention. This stop **14** includes a base **16** securely mounted on the inner surface of door **12** as by the illustrated screws, and the like, in a position adjacent but above the level of the lower edge portion **10** of door **12**. A rigid leg member **18** is aligned with and pivotally joined to base **16**, and has a pressure or foot portion **20** arranged for being forcibly pressed and readily actuated toward a gripping position engaging a floor associated with door **12** as by foot-applied pressure in a manner not shown. A coiled torsion spring **22** is connected to base **16** and leg member **18** for biasing leg member **18** toward a raised position away from the aforementioned associated floor.

A locking device **24** is mounted on base **16** for selectively engaging leg member **18** and holding same in any one of several gripping positions depending on the angle between leg member **18** and base **16** when the leg member is in its gripping or door-stopping position. As can be appreciated, this angle will be a function of the distance between base **16** and the associated floor being engaged by the leg member **18**.

Preferably, the locking device **24** includes an element **26** in the form of an aluminum extrusion, or the like, formed to suitable configuration and pivotally retained in a suitable partial cylindrical slot **27** provided in the front surface of base **16**. In this manner, element **26** extends from base **16** toward leg member **18**. A plurality of substantially parallel grooves **28** are provided across the face of leg member **18** so as to be parallel to the pivot axis of member **18** relative to base **16**, which pivot axis is defined by the partial cylindrical element **30** disposed in the associated slot **27**. These grooves **28** are arranged for selectively receiving the lower end of element **26** and retaining leg member **18** in any one of the several gripping positions. The exact groove receiving the element **26** is a function of the angle between leg member **18** and base **16**, which in turn is a function of the distance between base **16** and an associated floor or other abutment surface A. It could also be said that the particular groove **28** receiving element **26** is a function of the desired deflection, or biasing, of element **26**.

It will also be appreciated that the element **26** can retain leg member **18** in a desired raised position (not shown) so as to restrain leg member **18** from undesirable upward or raised movement under the influence of spring **22**, such that foot portion **20** of leg member **18** would be brought to an awkward position for foot actuation of the stop **14**.

A handle **32** is mounted as on the outer surface of element **26** for facilitating manipulation of element **26** relative to the associated grooves **28**, and for permitting disengagement of element **26** from a particular groove **28** in order to release stop **14** and permit door **12** to be inwardly opened. As illustrated, handle **32** can be simply a cylindrical element provided with a shank mounted on element **26**.

Leg member **18** extends longitudinally laterally of the pivot axis A—A (FIG. **3**) thereof, with base **16** including a lower portion **34** provided with a through hole **36** parallel to the pivot axis of leg member **18**. This hole **36**, the center of which forms the pivot axis A—A, is provided with an opening **38** along one longitudinal side thereof. Leg member **18** has an upper portion **40** spaced from the foot portion **20** and provided with a transversely extending cylindrical head **42** sized for being pivotally disposed in hole **36**. A neck **44** connecting head **42** to the remainder of leg member **18** is disposed in opening **38** so as to permit a limited pivotal movement of leg member **18** with respect to base **16**. Thus, the upward movement of leg member **18** under the bias of spring **22** is limited by the upper front surface of opening **38**, although the raised position of leg member **18** can also be limited by use of locking device **24** as described above.

The longitudinal extent of head **42** is advantageously less than the longitudinal extent of hole **36**, with head **42** and hole **36** terminating in alignment at a one of a pair of longitudinal end surfaces **46** and **48**. As illustrated in FIG. **3**, head **42** terminates at surface **46**, with the result that a space **50** is left in hole **36** adjacent the corresponding surface **48**. Spring **22** is disposed in the space **50**, with the spring ends **52** and **54** of spring **22** being disposed in suitably arranged slots **56** and **58** provided in base **16** and leg member **18**, respectively.

Foot portion **20** of leg member **18** is provided along the lower surface thereof with a compressibly resilient floor contacting anti-slipping longitudinal pad **60** which may be attached to leg member **18** as by the illustrated dove-tailed joint. By such a connection of pad **60** to leg member **18**, replacement of pad **60** may be easily effected as necessary.

Referring now more particularly to FIGS. **4** and **5** of the drawings, there is shown mounted adjacent the upper frame **110** of a sliding door or window designated generally by the reference numeral **112**, which door or window is of conventional construction, an occupant safeguarding door stop **114** according to the present invention. This stop **114** is basically identical in construction to stop **14** described above, but is provided with a base **116** having therein transverse apertures which receive conventional screws S that permit the stop **114** to be mounted on an upright frame member F of the door or window **112** in such a manner that the leg member **118** swings about an axis substantially perpendicular to the associated surface of frame F. A handle H is shown as provided on the frame F for facilitating manipulation of the sliding panel of the window or door **112**.

The stop **114** will be engaged and disengaged entirely by hand-pressure when mounted as illustrated in FIGS. **4** and **5**, but it is to be understood that such a stop **114** could be mounted adjacent the bottom of a horizontally sliding door or window in a manner not shown if so desired, and in the latter case foot-pressure could be employed for placing the stop in an operating mode.

FIG. **6** shows the use of the stop **114** according to the invention in conjunction with a horizontally sliding window portion **210**, partially forming a window, or other closure, generally designated by the reference numeral **212**. When thus arranged, pressure foot portion **120** of the stop **114** will engage against the adjacent surface of a jamb J of the window **212** in order to retain the movable or sliding portion **210** of the window **212** in a desired position.

In operation, leg member **18, 118** will be normally raised from engagement with floor **30**, or lowered from engagement of overhead frame **110** or other abutment surface, due to the bias of torsion spring **22, 122**. Although the raised position of leg member **18** is not illustrated, it will be appreciated that, as described above, it will be limited either by the locking device **24, 124** or the upper front surface of the opening **38**. When it is desired to prevent unauthorized persons, and the like, from opening the window or door, whether the doors be in closed position as shown in the figures of the drawings, or in partially open positions (not shown), an occupant of the dwelling or other structure being protected by stop **14, 114** merely applies foot or hand pressure to portion **20, 120** of leg member **18, 118** in order to overcome the bias of spring **22, 122** and force the leg member **18, 118** into gripping engagement with the abutment surface. As the pressure is slightly released once the gripping engagement is achieved, the free end of resilient element **26, 126** will engage in one of the grooves **28, 128** in order to prevent leg member **18, 118** from being forced out of its door-stopping position by any movement, inward or outward, of door **12** by the unauthorized person attempting entry. When it is desired to release **12, 112, 212** and permit opening and closing thereof, stop **14, 114** can be disengaged merely by the occupant pulling on handle **32, 132** and removing the resilient element **26, 126** from the associated one of the grooves **28, 128**. The force of torsion spring **22, 122** will tend to withdraw leg member **18, 118** from the abutment surface in conjunction with, perhaps, a slight movement of **12, 112, 212** in order to break the gripping arrangement between leg element **18, 118** and the abutment surface.

As can be readily understood from the above description and from the drawings, a door stop according to the present invention provides an easily installable and versatile device which does not require precision installation or becomes ineffective when used with overhead door or window frames of a new floor covering, and the like.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. For use on the interior surface of a closure, an occupant safeguarding stop including a base securely mountable on an interior surface of an associated closure in a position adjacent but spaced from a jamb of the closure, a rigid leg member including base and free ends and aligned with and having its base end pivotally joined to the base and having a pressure portion on its free end arranged to be forcibly pressed and readily actuated toward a gripping position engaged with an abutment surface associated with the closure, resilient means connected to the base and the leg member for biasing the leg member toward a position displaced away from the abutment surface gripping position, locking means mounted on the base for selectively engaging the leg member and holding the leg member in any one of several gripping positions depending on the angle between the base and the leg member, which angle is a function of the distance between the base and the abutment surface, said locking means including an elongated element having one end pivotally mounted on the base with its other end extending toward the leg member, a plurality of recesses provided on the leg member at points spaced therealong and arranged for selectively receiving a terminal end portion of the other end of said element and retaining the leg member in the gripping position, the exact recess receiving the terminal end portion of the elongated element being a function of the distance between the base and the abutment surface and the desired deflection of the element, said base having a pair of parallel elongated slots formed therein including opposite ends opening endwise outwardly of remote surfaces of said base, said slots including narrow outer longitudinal portions opening laterally outwardly of a side of said base extending between said remote surfaces, the inner portions of said slots being widened and of partial cylindrical configuration, said one end of said elongated element and said base end of said leg member including transverse partial cylindrical portions extending transversely thereof and supported from said element and leg member by narrow neck portions, said element and leg member partial cylindrical portions being lengthwise received in the inner portions of said slots with said neck portions loosely received through said narrow outer slot portions, said leg member partial cylindrical portion including a first end thereof terminating inwardly of the corresponding end of the associated slot, said resilient means including a coil spring disposed within said end of said associated slot and including spring ends engaged with said leg member and base.

2. The combination of claim **1** wherein said recesses include open ended parallel grooves formed in and extending transversely of one side surface of said leg member corresponding to said side of said base outwardly through which said slots open.

3. A structure as defined in claim **1**, wherein the free end portion of the leg member is provided with a compressibly resilient abutment surface contacting anti-slipping pad.

* * * * *